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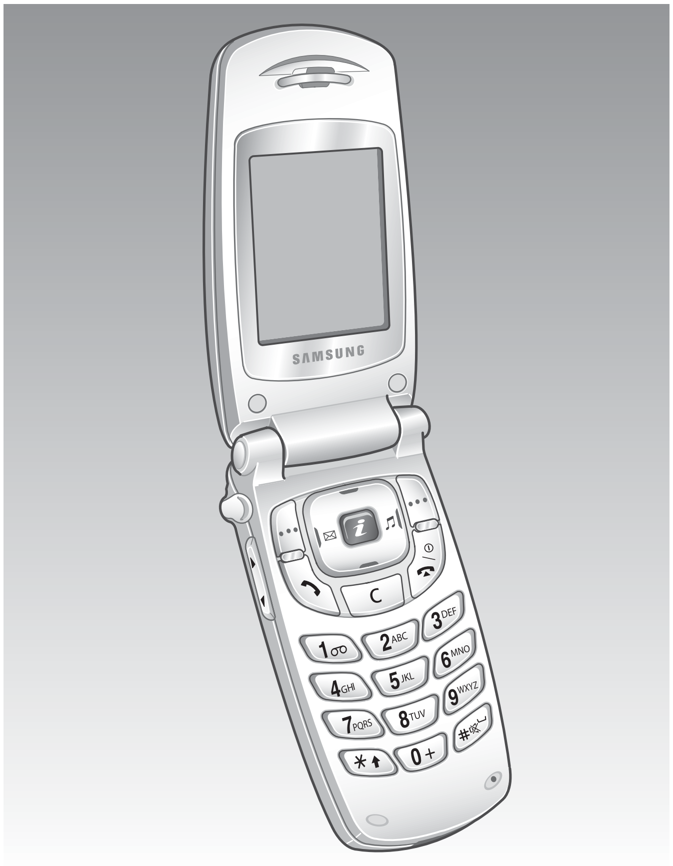
SAMSUNG ELECTRONICS

DUAL BAND Mobile Cellular Phone

SGH-S500

SERVICE Manual

DUAL BAND MOBILE CELLULAR PHONE



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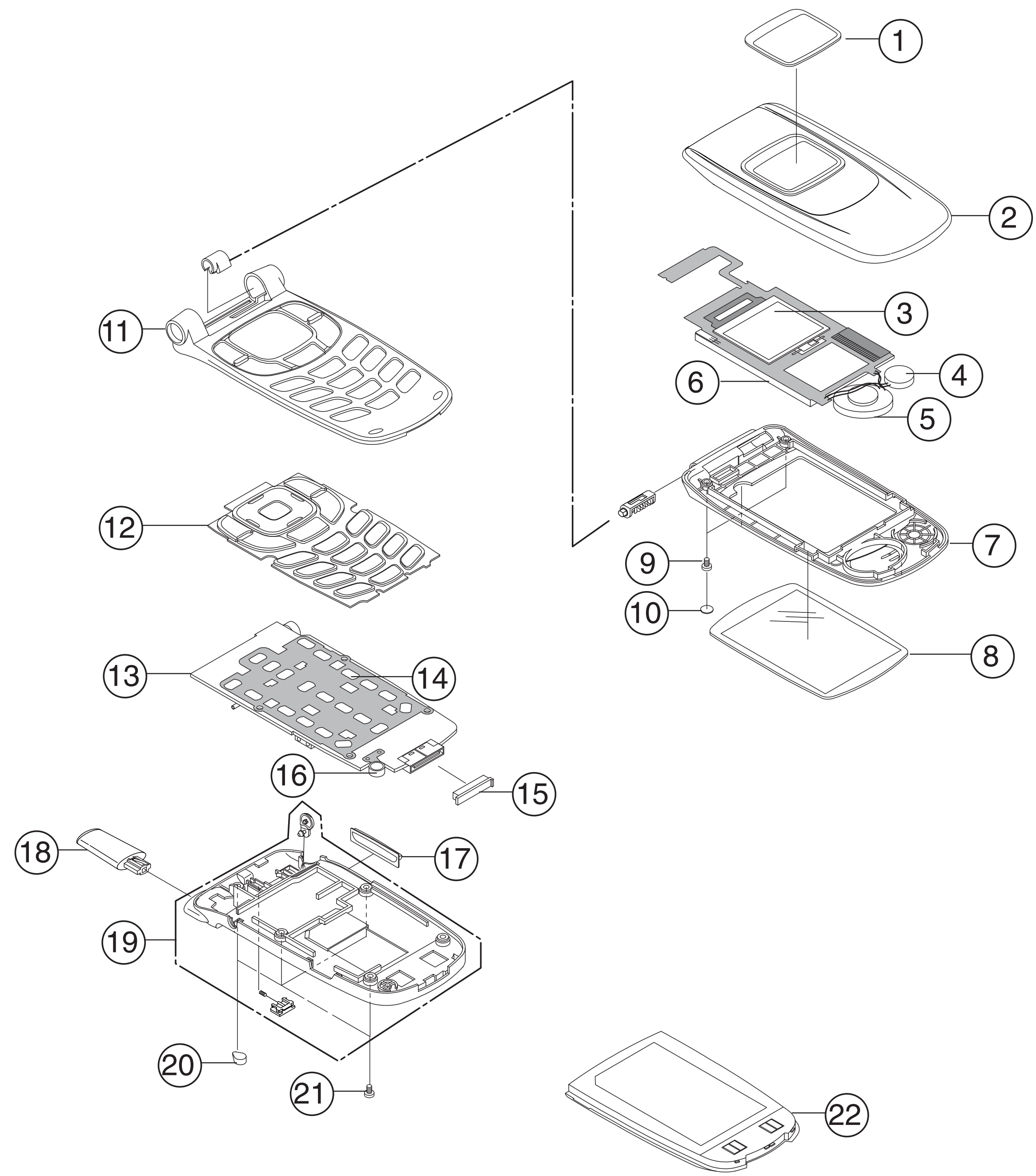
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1. SGH-S500 Exploded Views and Parts List

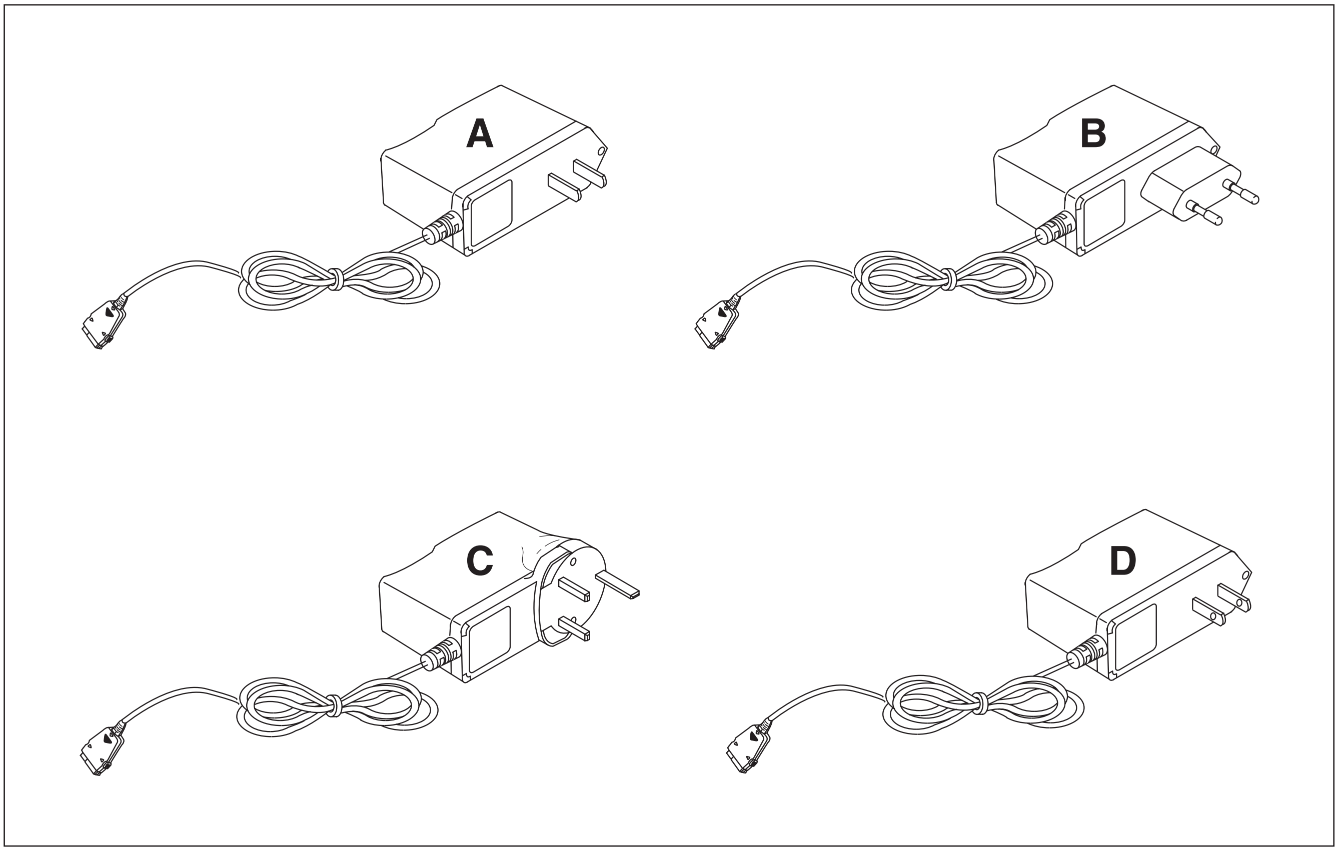
1-1 Main



1-2 Main Parts List

Location No.		Description	SEC CODE	Remark
1		SUB WINDOW LCD	GH72-05977A	
2		FOLDER UPPER	GH75-02248A	
3		LCD	GH07-00316A	
4		MOTOR	3101-001294	
5		SPEAKER	3001-001390	
6		MAIN LCD	GH07-00190A	
7		FOLDER LOWER	GH75-02249A	
8		MAIN WINDOW LCD	GH75-02999A	
9		SCREW	6001-001479	
10		SCREW CAP	GH74-03662A	
11		FRONT COVER	GH75-02250A	
12		KEYPAD	GH75-02247A	
13		MAIN PBA	GH92-01368A	
14		DOME SHEET	GH59-00727A	
15		CONNECTOR COVER	GH73-01394A	
16		MIC	GH30-00014A	
17		SIDE KEY	GH75-02264A	
18		ANTENNA	GH42-00292A	
19		REAR COVER	GH75-02251A	
20		RF COVER	GH73-01553A	
21		SCREW	6001-001479	
22		BATTERY	GH43-00836A	

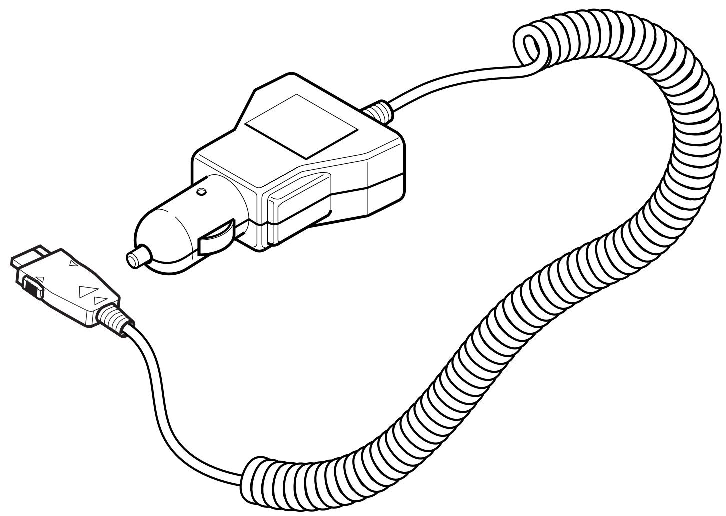
1-3 Travel Adapter



1-4 Travel Adapter Parts List

TYPE	SEC CODE	REMARK
A	GH44-00171A	CHINA
B	GH44-00184A	EUROPE
C	GH44-00171C	UNITED KINGDOM
D	Gh44-00171E	TAIWAN

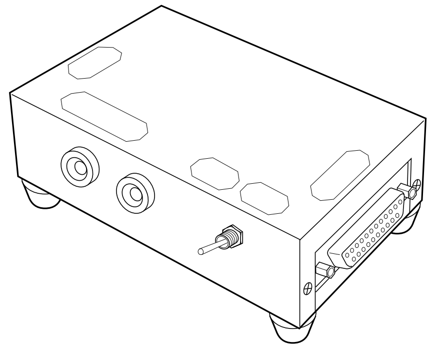
1-5 Ciger Light Adapter



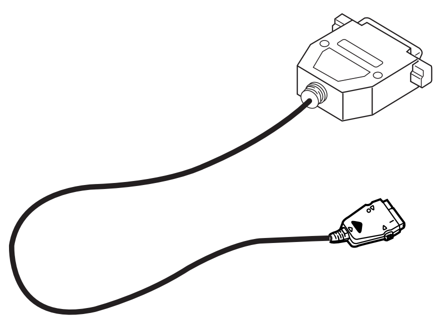
1-6 Ciger Light Adapter Parts List

DESCRIPTION	SEC CODE	REMARK
Ciger Light Adapter Code	GH44-00170A	BLACK

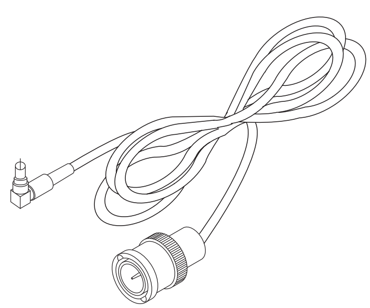
1-7 Test Jig



TEST JIG	GH80-01909A

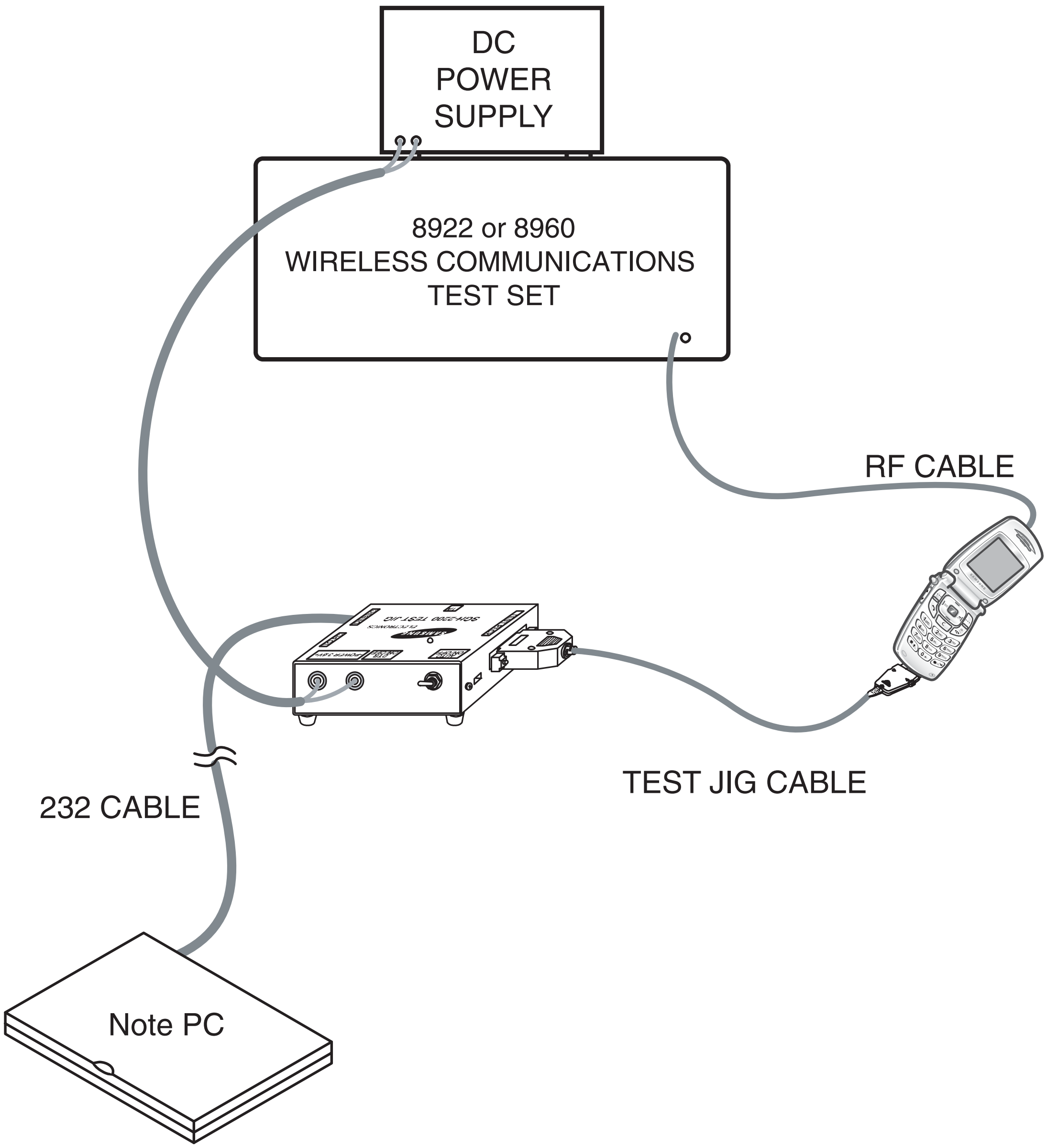


TEST JIG CABLE	GH39-000217A

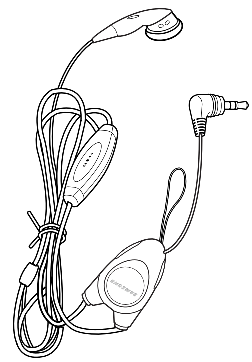


RF CABLE	GH39-00172A

1-7-1 Test Jig

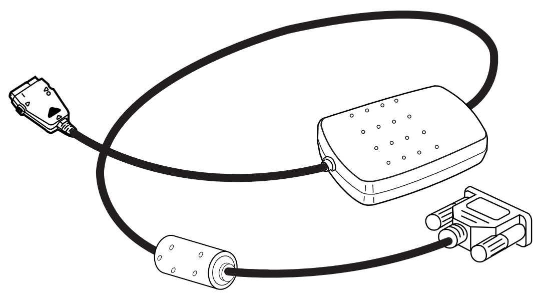

DC
POWER
SUPPLY
8922 or 8960
WIRELESS COMMUNICATIONS
TEST SET
RF CABLE
232 CABLE
TEST JIG CABLE
Note PC

1-8 Wearable EAR Microphone



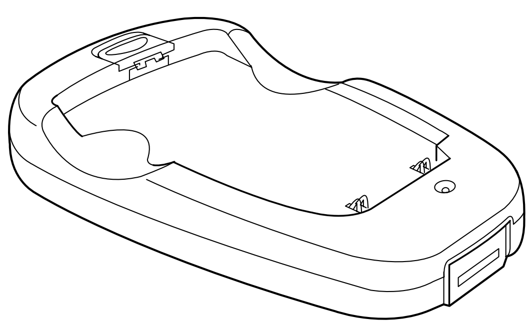
Wearable EAR Microphone	GH59-00394B

1-9 Data Kit



DATA KIT	GH39-00143B

1-10 Battery Charger



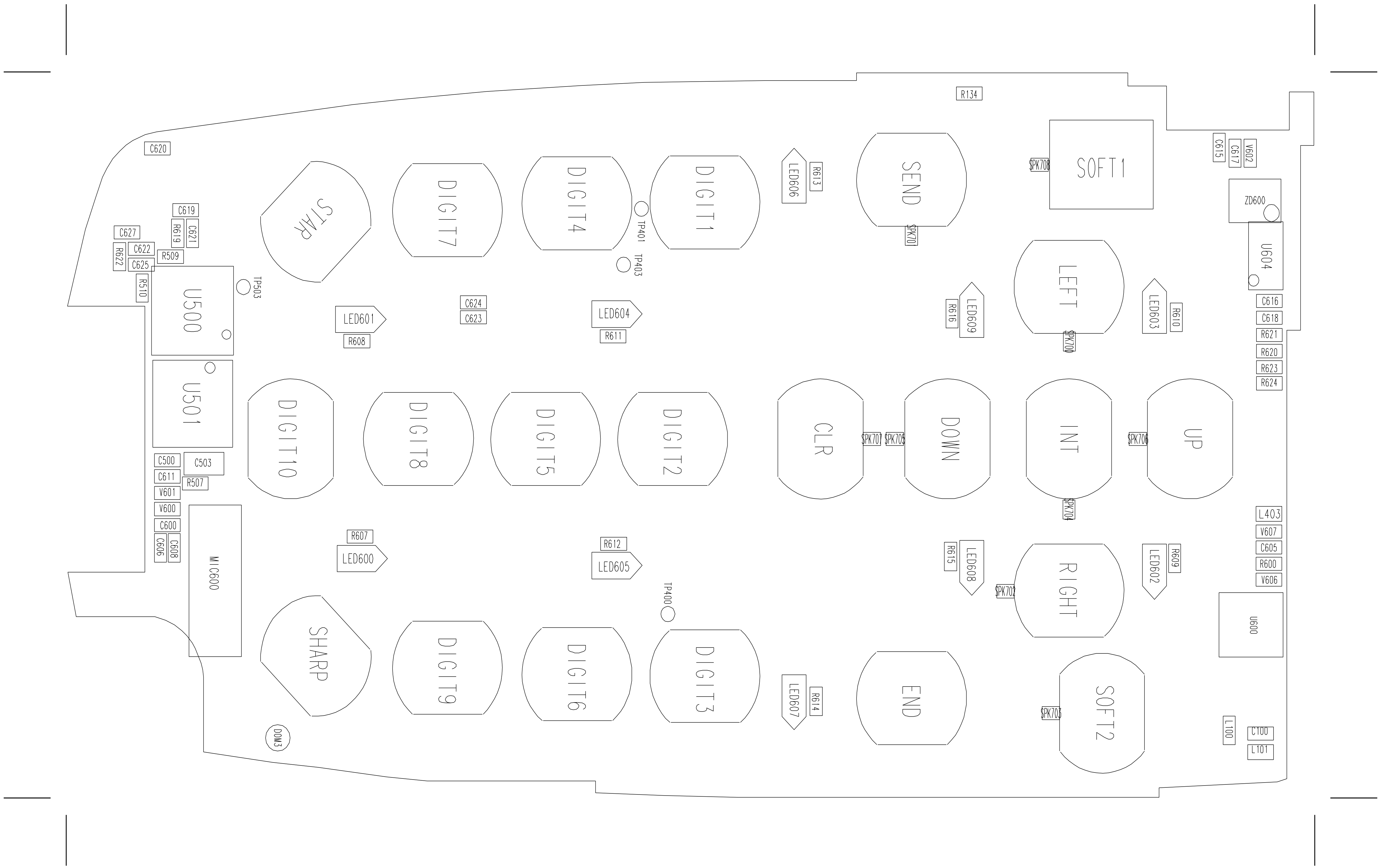
BATTERY CHARGER	GH44-00279A

2. PCB Diagrams

2-1 Main Top



2-2 Main Bottom



3. Electrical Parts List

NO	SEC CODE	DESIGN LOC
1	0404-001077	D100
2	0405-001122	D101
3	0501-002051	Q100
4	0504-001060	U109
5	0504-001060	U110
6	0505-001423	U397
7	0505-001423	U724
8	0506-000107	Q500
9	0506-000107	Q700
10	0604-001146	U601
11	0801-002237	U300
12	0801-002540	U394
13	0801-002540	U700
14	1001-001183	U602
15	1001-001231	U720
16	1001-001231	U721
17	1109-001243	U722
18	1201-001785	U102
19	1203-002824	U111
20	1204-001960	U303
21	1205-002257	U400
22	1205-002264	U101
23	1205-002276	U200
24	1209-001429	U106
25	1404-001221	TH500
26	1405-001082	D102
27	1405-001082	D103
28	1405-001082	D104
29	1405-001082	D105
30	1405-001082	V604
31	1405-001082	V605
32	1405-001082	V608
33	2007-000138	R105
34	2007-000140	R126
35	2007-000140	R128
36	2007-000140	R401
37	2007-000141	R207
38	2007-000141	R208
39	2007-000141	U708

NO	SEC CODE	DESIGN LOC
40	2007-000142	R100
41	2007-000142	R101
42	2007-000142	R102
43	2007-000142	R103
44	2007-000142	R113
45	2007-000146	U709
46	2007-000148	R130
47	2007-000148	R135
48	2007-000148	R136
49	2007-000148	R201
50	2007-000148	R400
51	2007-000148	R203
52	2007-000148	R506
53	2007-000148	R604
54	2007-000148	R625
55	2007-000151	R116
56	2007-000151	R109
57	2007-000155	R124
58	2007-000162	R202
59	2007-000162	R205
60	2007-000162	R500
61	2007-000162	R501
62	2007-000162	R585
63	2007-000162	R597
64	2007-000162	R628
65	2007-000162	R618
66	2007-000162	R629
67	2007-000162	R630
68	2007-000162	R631
69	2007-000171	R115
70	2007-000171	R127
71	2007-000171	R503
72	2007-000171	R596
73	2007-000171	R626
74	2007-000171	R627
75	2007-000171	U702
76	2007-000173	R104
77	2007-000173	R108
78	2007-000242	R601

NO	SEC CODE	DESIGN LOC
79	2007-000242	R617
80	2007-000932	R114
81	2007-000982	R112
82	2007-001305	R118
83	2007-001305	R122
84	2007-001306	R106
85	2007-001306	R107
86	2007-001306	R110
87	2007-001306	R111
88	2007-001313	R132
89	2007-001313	U707
90	2007-001319	U703
91	2007-001323	R131
92	2007-001325	U706
93	2007-002797	R121
94	2007-003030	R123
95	2007-007001	R206
96	2007-007009	R125
97	2007-007100	R402
98	2007-007334	R505
99	2007-007573	R504
100	2007-007588	R117
101	2007-007588	R133
102	2007-007699	R119
103	2007-007699	R120
104	2203-000233	C124
105	2203-000233	C125
106	2203-000233	C127
107	2203-000233	C129
108	2203-000233	C131
109	2203-000233	C132
110	2203-000233	C136
111	2203-000233	C138
112	2203-000233	C149
113	2203-000254	C144
114	2203-000254	C204
115	2203-000254	C410
116	2203-000254	C478
117	2203-000254	C704

NO	SEC CODE	DESIGN LOC
118	2203-000254	C706
119	2203-000254	C707
120	2203-000278	C102
121	2203-000278	C122
122	2203-000278	C123
123	2203-000278	C133
124	2203-000278	C154
125	2203-000278	C155
126	2203-000278	C407
127	2203-000278	C609
128	2203-000278	C613
129	2203-000278	C115
130	2203-000330	C412
131	2203-000330	C416
132	2203-000330	C601
133	2203-000330	C612
134	2203-000330	C708
135	2203-000374	C140
136	2203-000386	C709
137	2203-000425	C104
138	2203-000425	C106
139	2203-000438	U710
140	2203-000585	C118
141	2203-000585	C119
142	2203-000585	C120
143	2203-000585	C121
144	2203-000628	C139
145	2203-000679	C101
146	2203-000812	C105
147	2203-000812	C111
148	2203-000812	C113
149	2203-000812	C114
150	2203-000836	C147
151	2203-000854	C110
152	2203-000854	C137
153	2203-000854	C146
154	2203-000885	C150
155	2203-000885	U717
156	2203-000995	C607

NO	SEC CODE	DESIGN LOC
157	2203-001153	C148
158	2203-001405	C109
159	2203-001598	C417
160	2203-001598	C420
161	2203-001607	C128
162	2203-001652	C414
163	2203-001652	C425
164	2203-002687	U715
165	2203-005056	C141
166	2203-005057	C134
167	2203-005061	C200
168	2203-005061	C201
169	2203-005061	C202
170	2203-005061	C203
171	2203-005061	C205
172	2203-005061	C206
173	2203-005061	C207
174	2203-005061	C208
175	2203-005061	C209
176	2203-005061	C210
177	2203-005061	C211
178	2203-005061	C212
179	2203-005061	C213
180	2203-005061	C214
181	2203-005061	C215
182	2203-005061	C400
183	2203-005061	C401
184	2203-005061	C403
185	2203-005061	C480
186	2203-005061	C501
187	2203-005061	C603
188	2203-005061	C610
189	2203-005061	U712
190	2203-005061	U713
191	2203-005065	C112
192	2203-005065	C143
193	2203-005065	C424
194	2203-005065	C614
195	2203-005446	C142

NO	SEC CODE	DESIGN LOC
196	2203-005482	C419
197	2203-005482	C135
198	2203-005482	C413
199	2203-005482	U718
200	2203-005496	U716
201	2203-005664	C402
202	2203-005664	C418
203	2203-006053	C415
204	2203-006053	C426
205	2203-006053	C428
206	2203-006053	C429
207	2203-006053	C430
208	2203-006053	C431
209	2203-006053	U714
210	2203-006053	C152
211	2203-006090	C423
212	2203-006208	C409
213	2203-006274	C151
214	2301-001512	C130
215	2404-001105	C422
216	2404-001105	C408
217	2404-001105	C427
218	2404-001105	C504
219	2404-001276	C117
220	2503-001045	C700
221	2503-001045	C701
222	2503-001045	C702
223	2503-001045	C703
224	2703-001709	L108
225	2703-002370	L103
226	2703-002485	R603
227	2703-002485	R606
228	2703-002519	L102
229	2703-002586	L104
230	2703-002596	L107
231	2703-002597	L401
232	2703-002597	L404
233	2703-002606	L105
234	2801-004025	X400

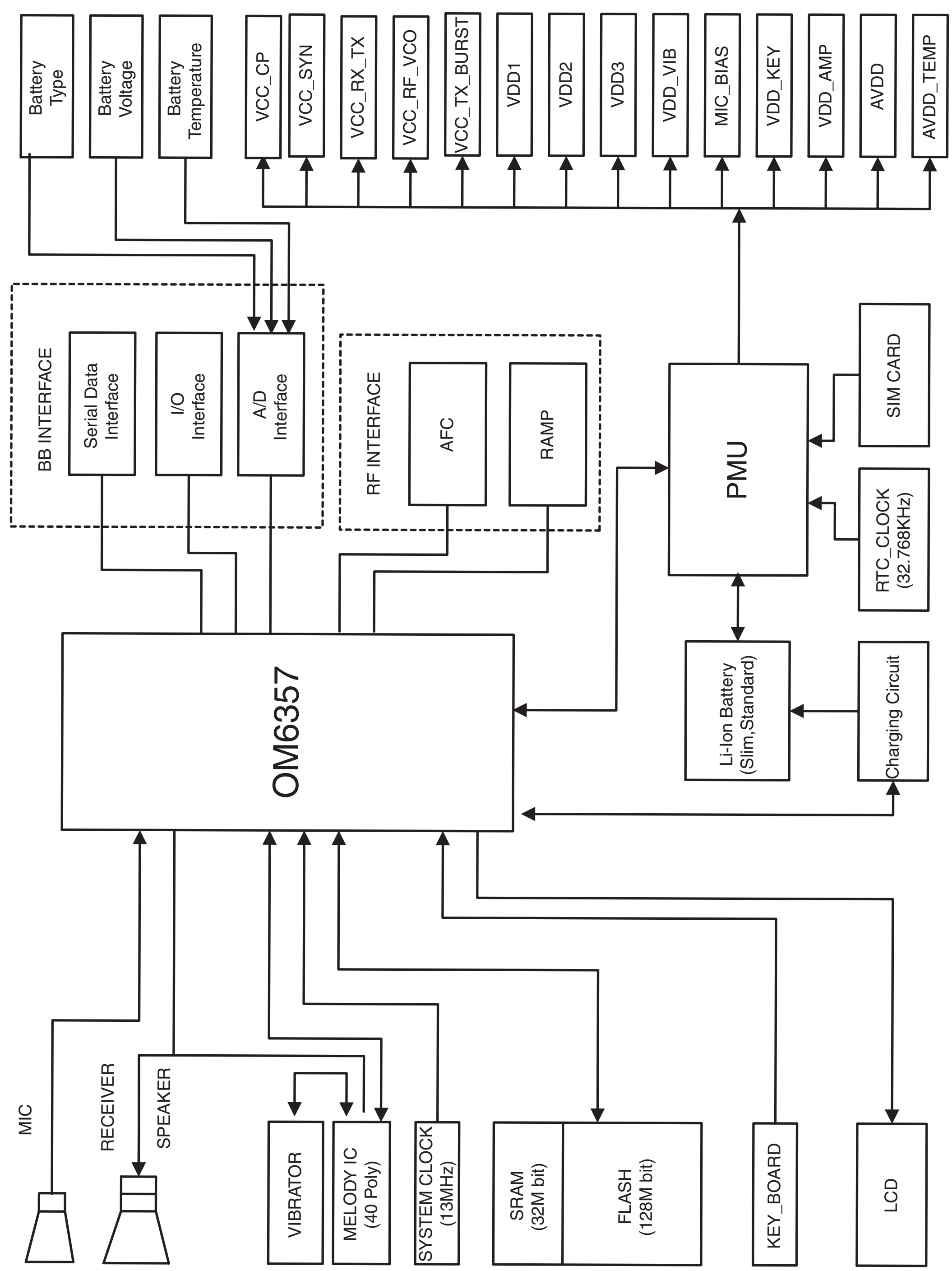
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236	2806-001310	U108
237	2809-001271	U107
238	2904-001417	F100
239	2904-001424	F101
240	2909-001197	U100
241	3301-001105	L400
242	3301-001630	L106
243	3404-001152	SW700
244	3404-001152	SW701
245	3705-001242	CN101
246	3709-001250	CN400
247	3710-001816	CN500
248	3711-005078	CN700
249	3722-001715	EAR600
250	4302-001119	C411
251	4709-001296	U105
252	4709-001297	U104

NO	SEC CODE	DESIGN LOC
1	0406-001104	ZD600
2	0601-001647	LED600
3	0601-001647	LED602
4	0601-001647	LED601
5	0601-001647	LED603
6	0601-001647	LED604
7	0601-001647	LED605
8	0601-001647	LED606
9	0601-001647	LED607
10	0601-001647	LED608
11	0601-001647	LED609
12	1009-001010	U600
13	1202-001036	U604
14	1203-002764	U501
15	1405-001082	V602
16	1405-001082	V607
17	1405-001082	V606
18	1405-001082	V600

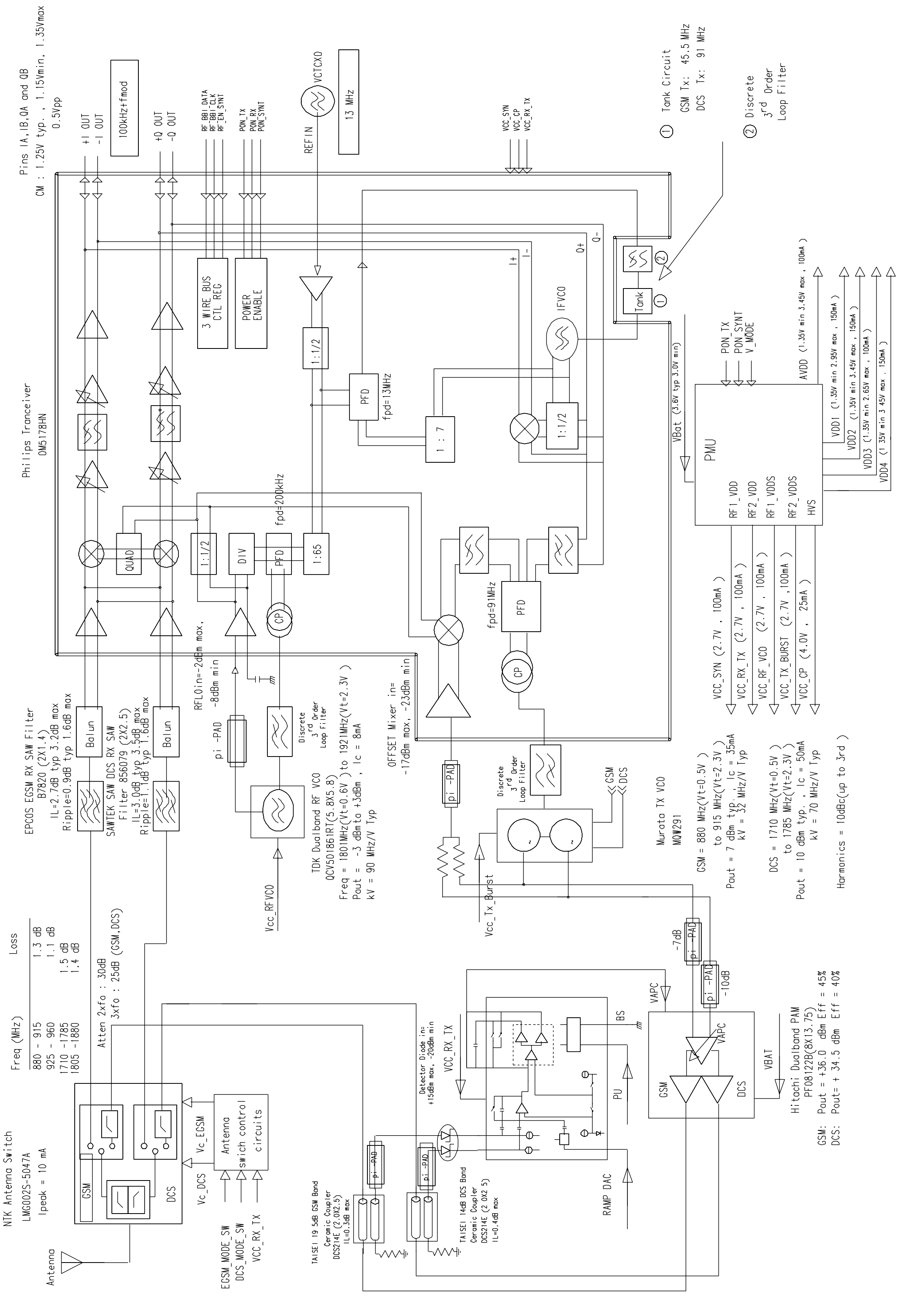
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19	1405-001082	V601
20	2007-000148	R619
21	2007-000162	R600
22	2007-000164	R507
23	2007-000171	R622
24	2007-001298	R608
25	2007-001298	R611
26	2007-001301	R609
27	2007-001301	R610
28	2007-001301	R615
29	2007-001301	R616
30	2007-003030	R614
31	2007-003030	R607
32	2007-003030	R612
33	2007-003030	R613
34	2007-007334	R623
35	2007-007480	R624
36	2007-007528	R510
37	2007-007981	R621
38	2007-008117	R509
39	2007-008312	R620
40	2203-000330	C611
41	2203-000330	C600
42	2203-000425	C608
43	2203-000438	C621
44	2203-000438	C620
45	2203-000628	C606
46	2203-000995	C617
47	2203-000995	C615
48	2203-000995	C618
49	2203-001383	C100
50	2203-005061	C605
51	2203-005281	L100
52	2203-005482	C619
53	2203-005482	C622
54	2203-006053	C503
55	2703-001284	L101
56	2703-002597	L403
57	2901-001246	U500

4. Block Diagrams

4-1 Main Baseband



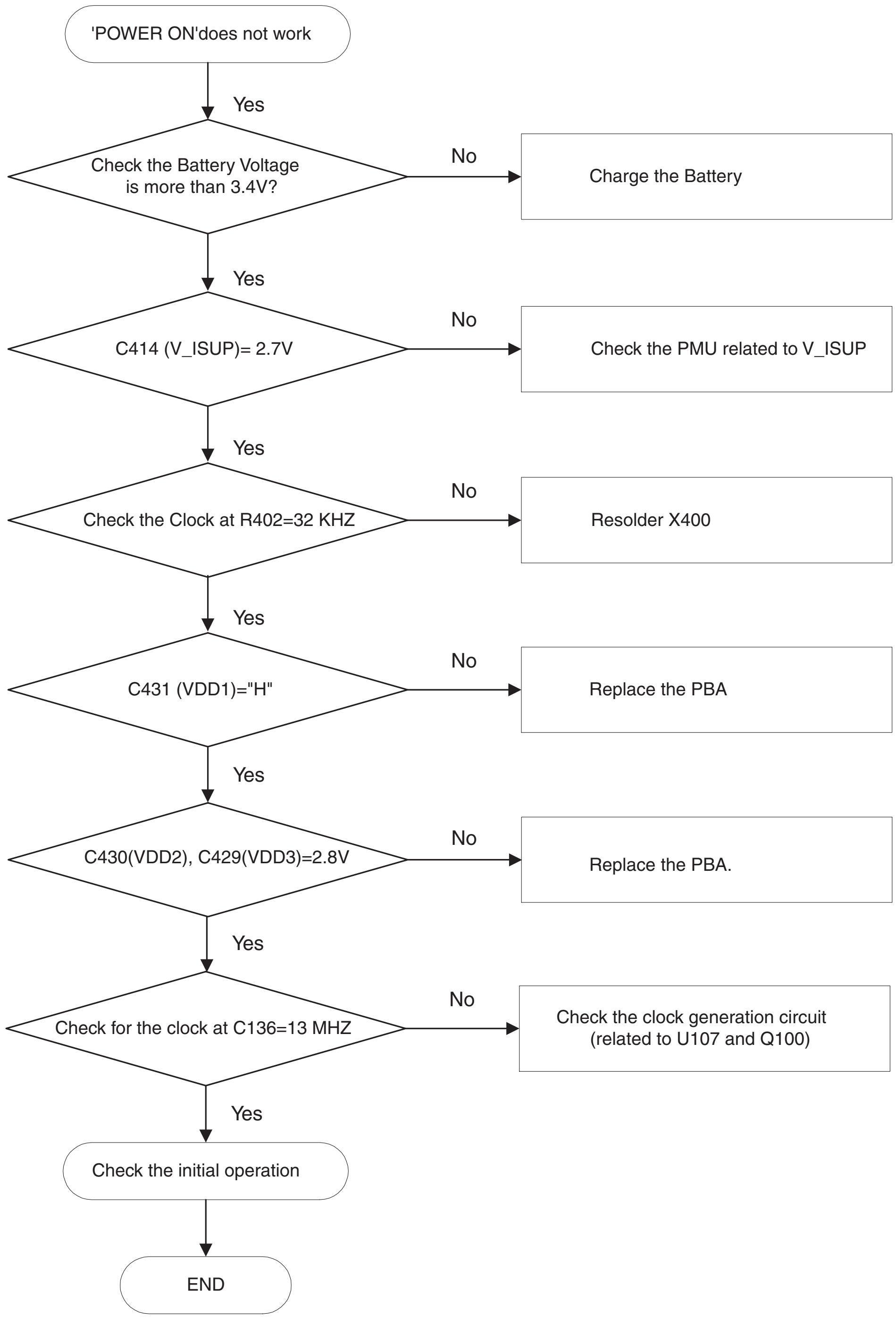
4-2 Main RF

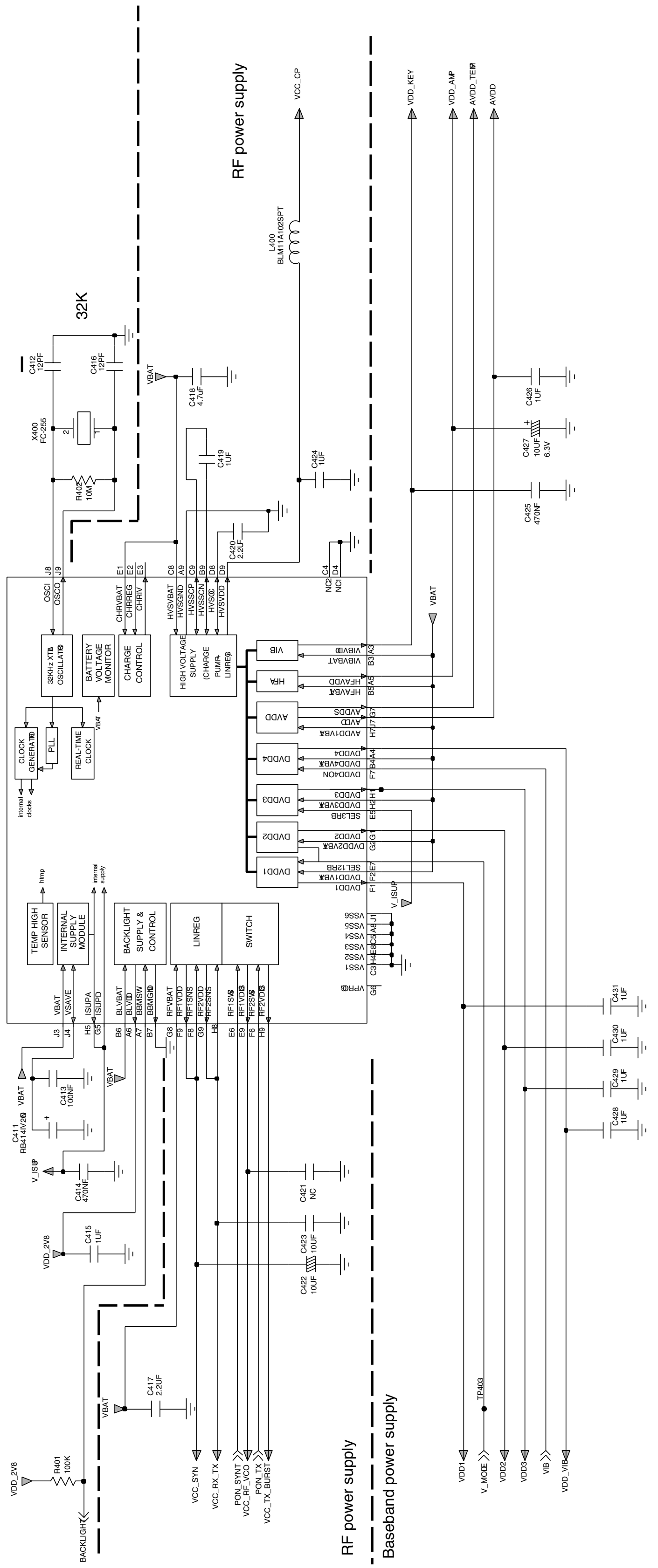


Pins IA,IB,QA and QB
CM : 1.25V typ. , 1.15Vmin, 1.35Vmax
0.5Vpp
+I OUT
-I OUT
100kHz+fmod
+Q OUT
-Q OUT
REFIN
VCTCXO
13 MHz
Tank Circuit
GSM Tx: 45.5 MHz
DCS Tx: 91 MHz
Discrete
3rd Order
Loop Filter
Philips Tranceiver
OM5178HN
3 WIRE BUS
CTL REG
POWER
ENABLE
1:1/2
PFD
fpd=13MHz
1 : 7
IFVCO
Tank
QUAD
DIV
fpd=200kHz
1:65
fpd=91MHz
CP
Balun
EPCOS EGSM RX SAW Filter
SAWTEK SAW DCS RX SAW
RFLOin=-2dBm max,
-8dBm min
pi -PAD
OFFSET Mixer in=
-17dBm max, -23dBm min
TDK Dualband RF VCO
Vcc_RFVCO
Murata TX VCO
MQW291
Vcc_Tx_Burst
PMU
VBat
PON_TX
PON_SYNT
V_MODE
Freq (MHz)
Loss
880 - 915
925 - 960
1710 - 1785
1805 - 1880
Atten 2xfo : 30dB
3xfo : 25dB (GSM,DCS)
NTK Antenna Switch
LMG002S-5047A
Ipeak = 10 mA
Antenna
GSM
DCS
Antenna
swich control
circuits
EGSM_MODE_SW
DCS_MODE_SW
VCC_RX_TX
RAMP DAC
VAPC
Hitachi Dualband PAM
PF08122B(8X13.75)
GSM: Pout = +36.0 dBm Eff = 45%
DCS: Pout= + 34.5 dBm Eff = 40%
Harmonics = 10dBc(up to 3rd)

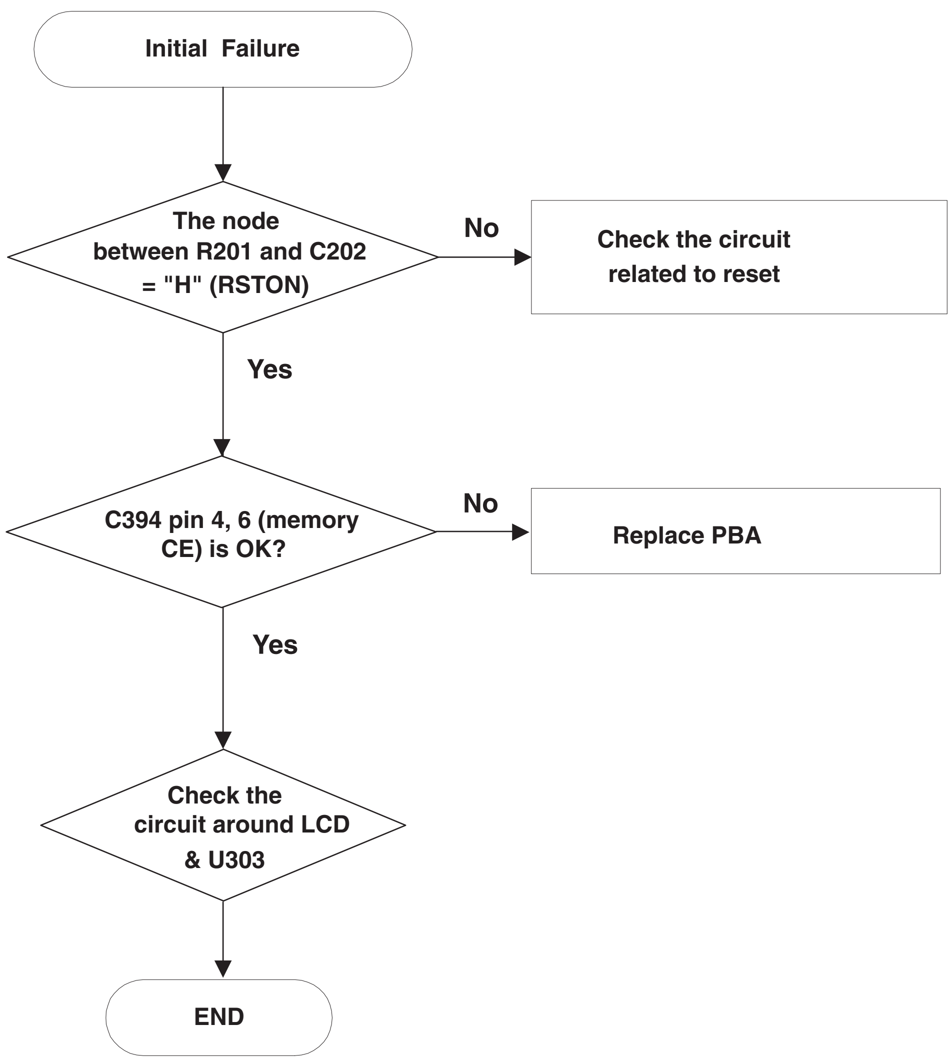
5. Flow Chart of Troubleshooting and Circuit Diagrams

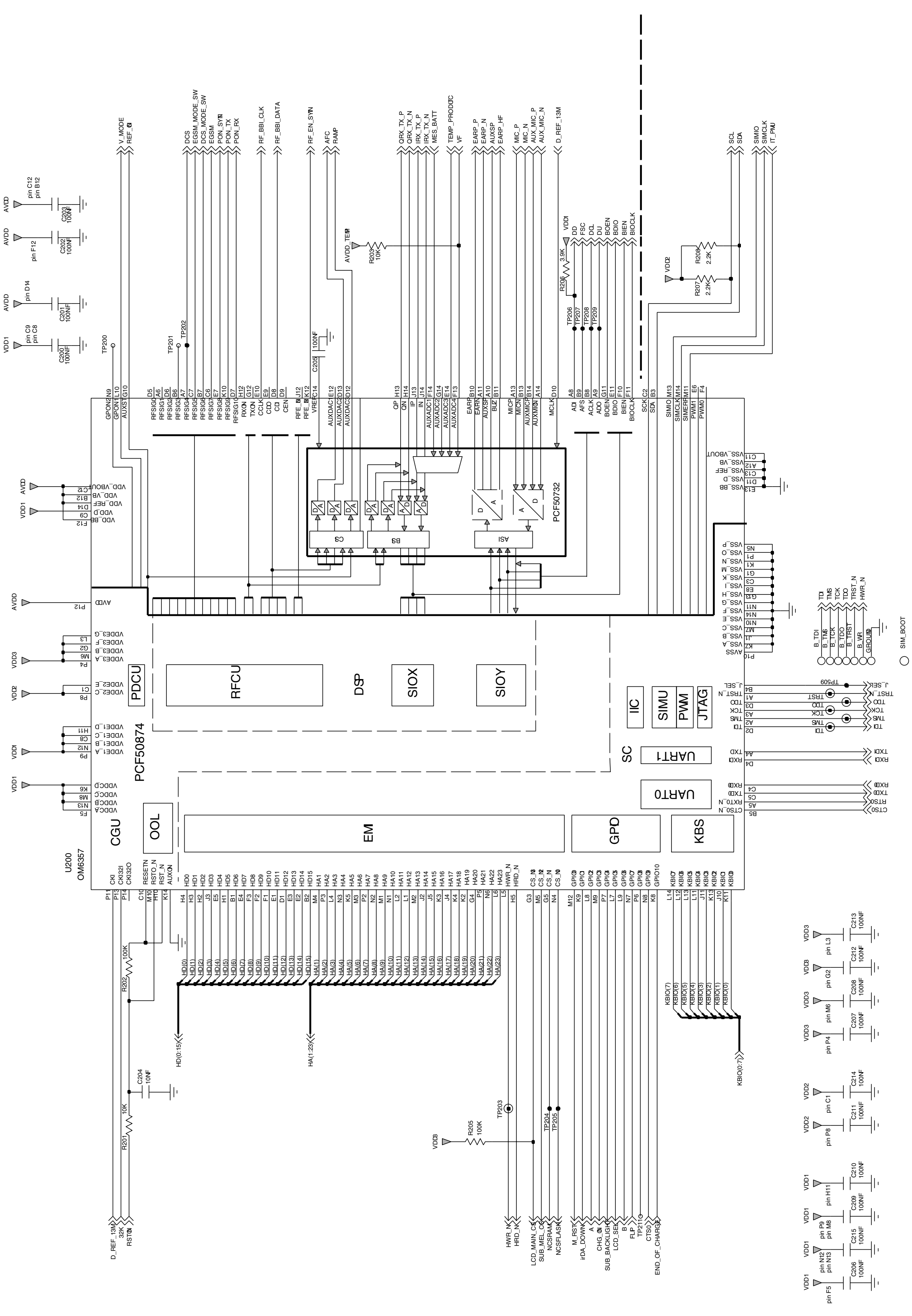
5-1 Power ON



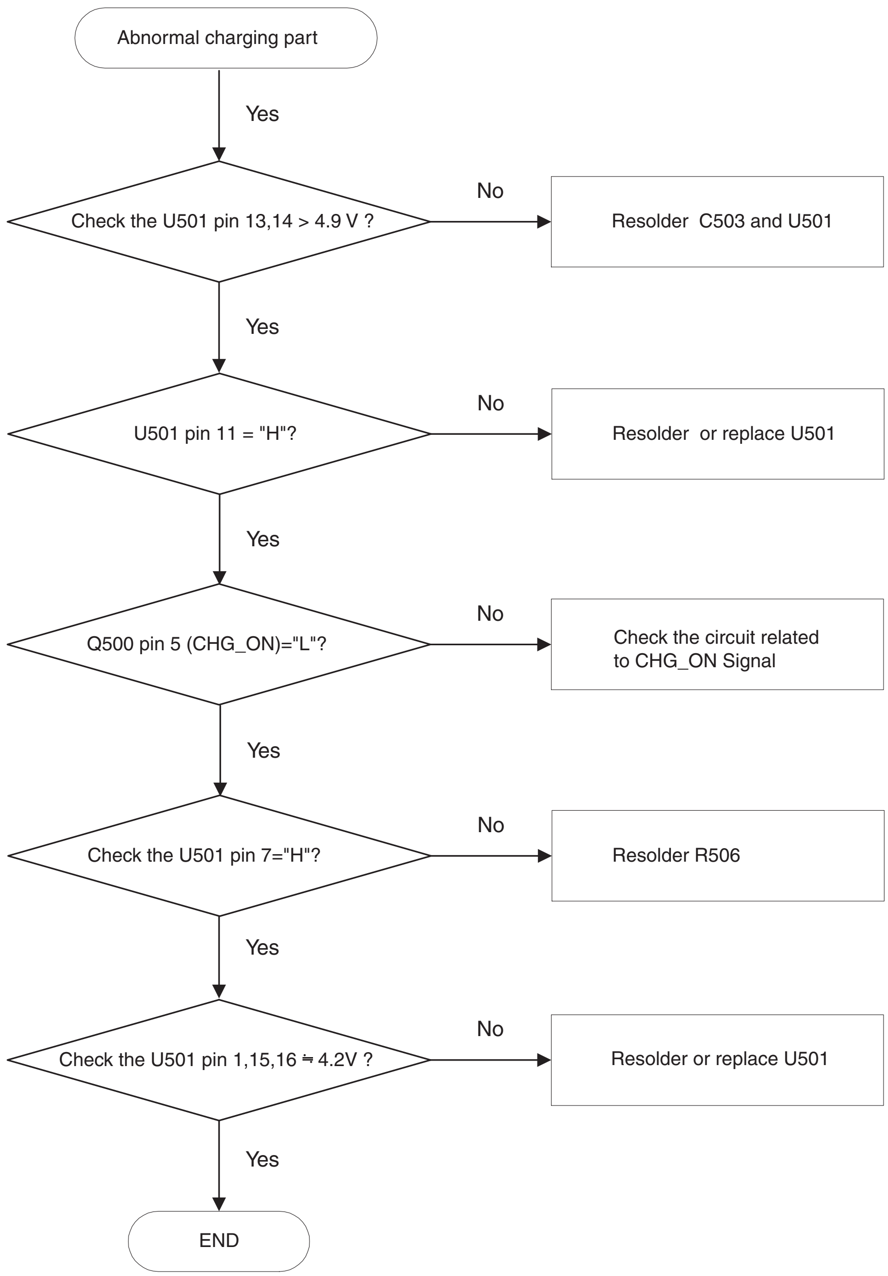

RF power supply
32K
RF power supply
Baseband power supply

5-2 Initial

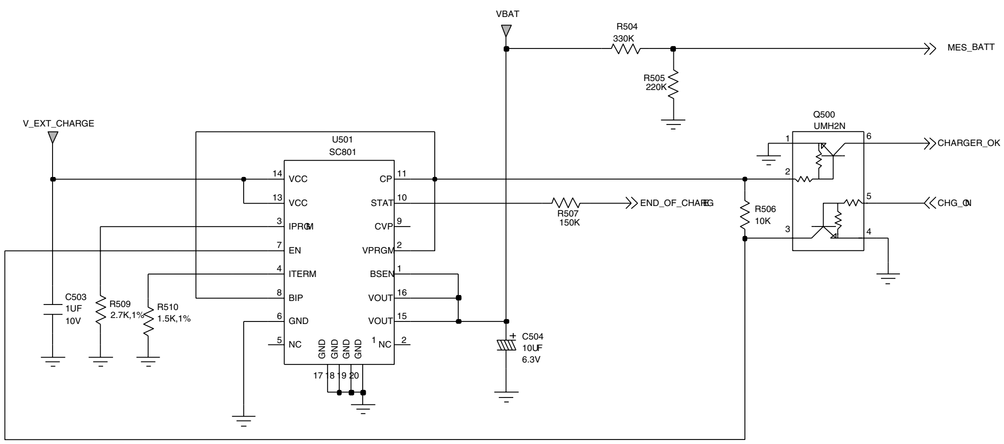

Initial Failure
The node between R201 and C202 = "H" (RSTON)
No
Check the circuit related to reset
Yes
C394 pin 4, 6 (memory CE) is OK?
No
Replace PBA
Yes
Check the circuit around LCD & U303
END


U200
OM6357
PCF50874
PCF50732
CGU
OOL
EM
GPD
KBS
UART0
UART1
SC
IIC
SIMU
PWM
JTAG
PDCU
RFCU
DSP
SIOX
SIOY

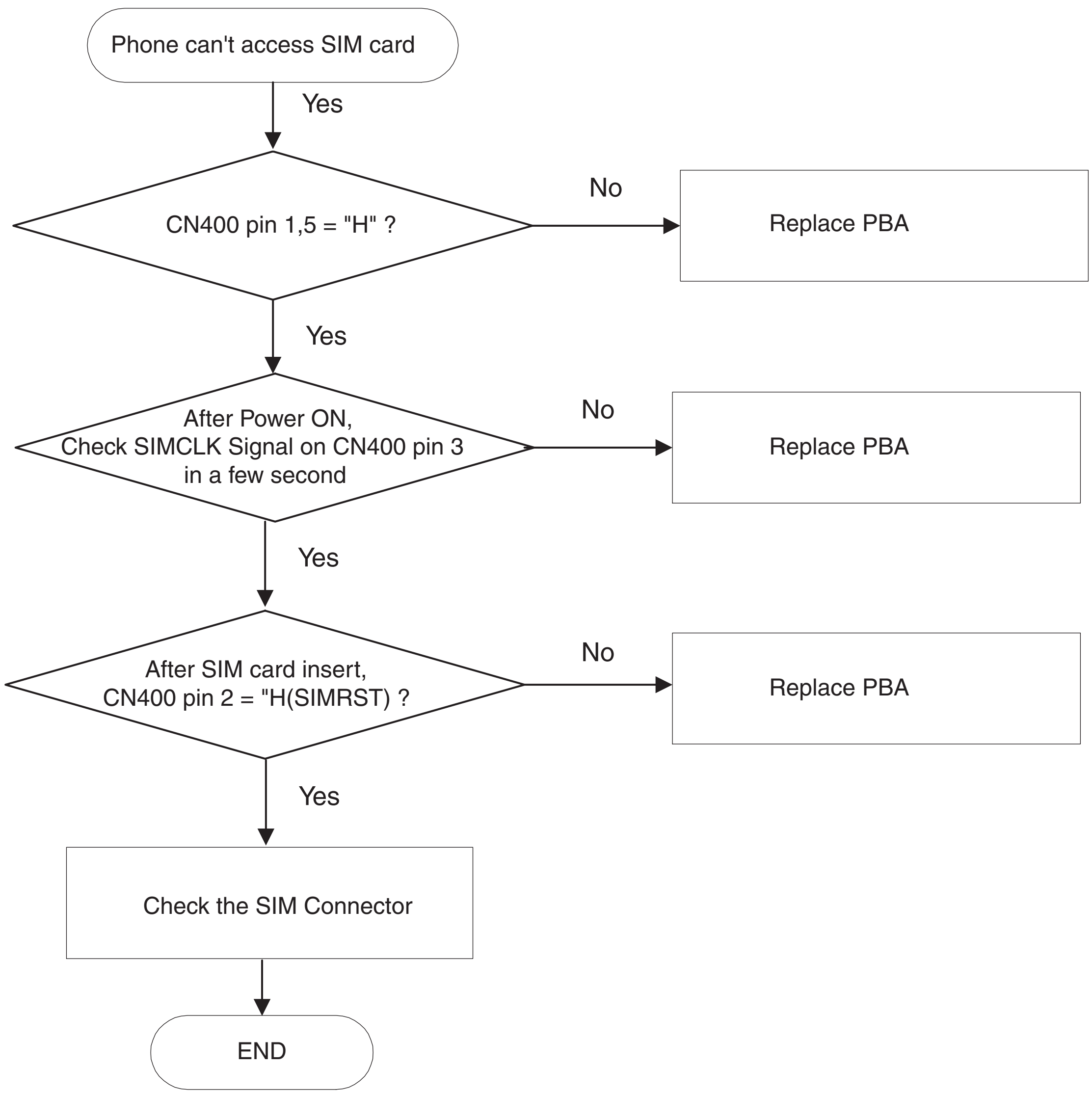
5-3 Charging Part



Charge of Battery

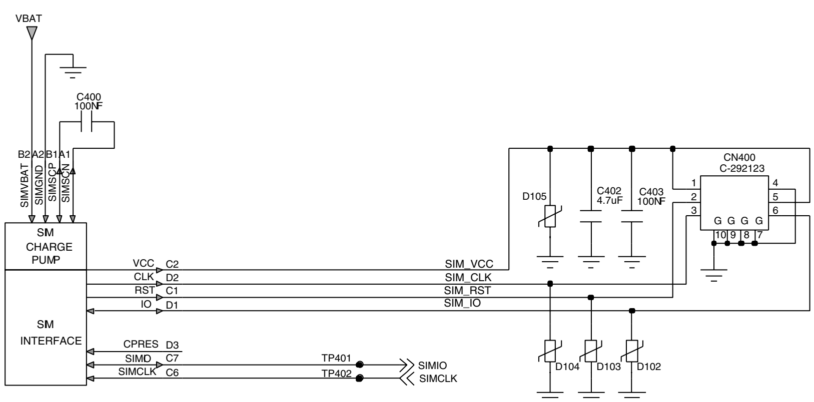


5-4 Sim Part

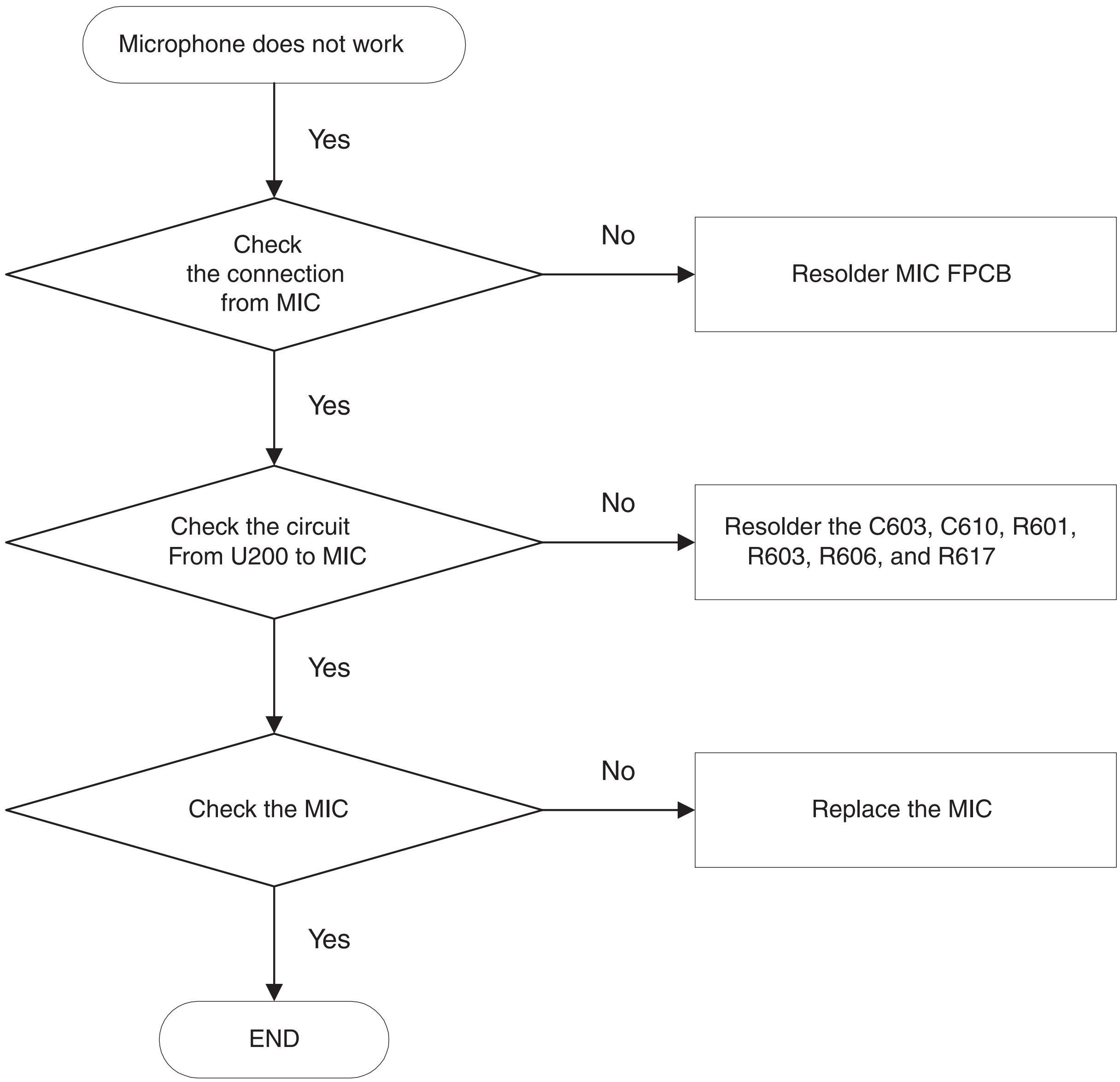


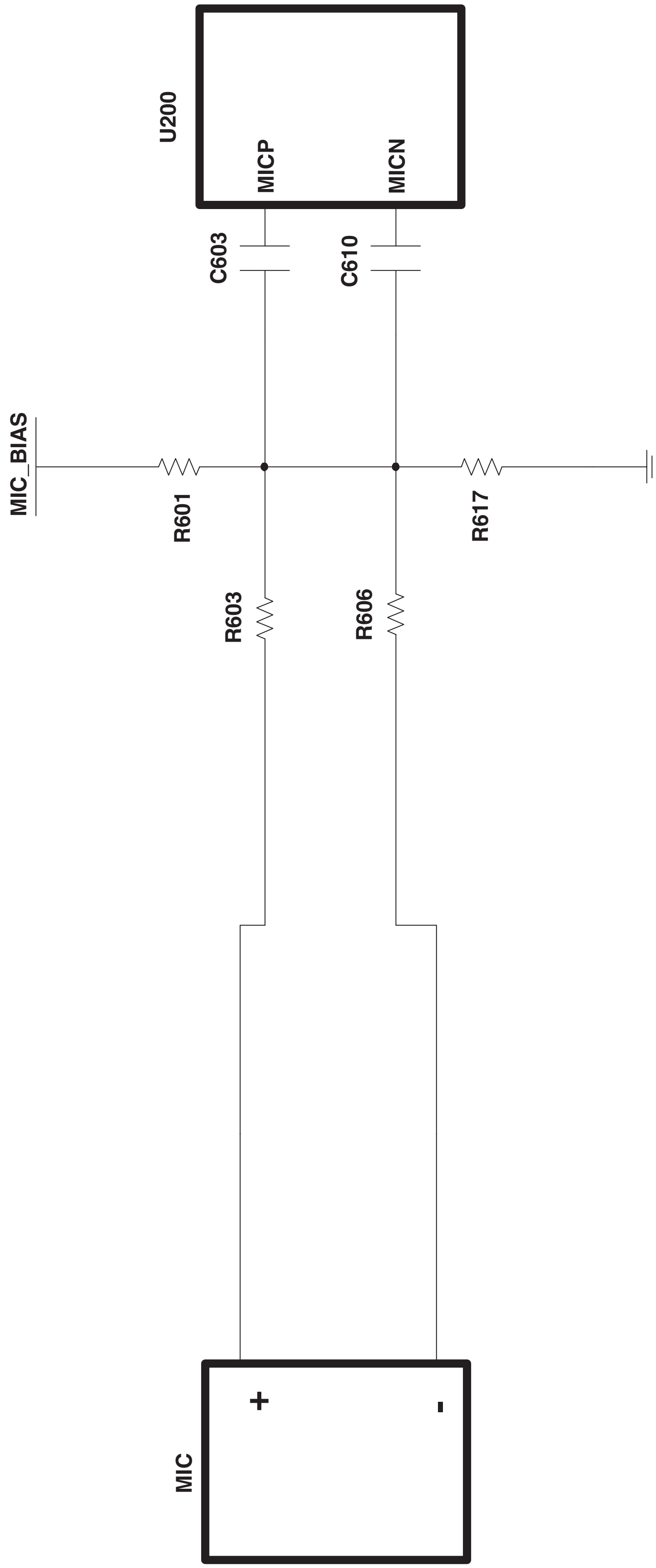
Phone can't access SIM card
Yes
CN400 pin 1,5 = "H" ?
No
Replace PBA
Yes
After Power ON,
Check SIMCLK Signal on CN400 pin 3
in a few second
No
Replace PBA
Yes
After SIM card insert,
CN400 pin 2 = "H(SIMRST) ?
No
Replace PBA
Yes
Check the SIM Connector
END

SIM

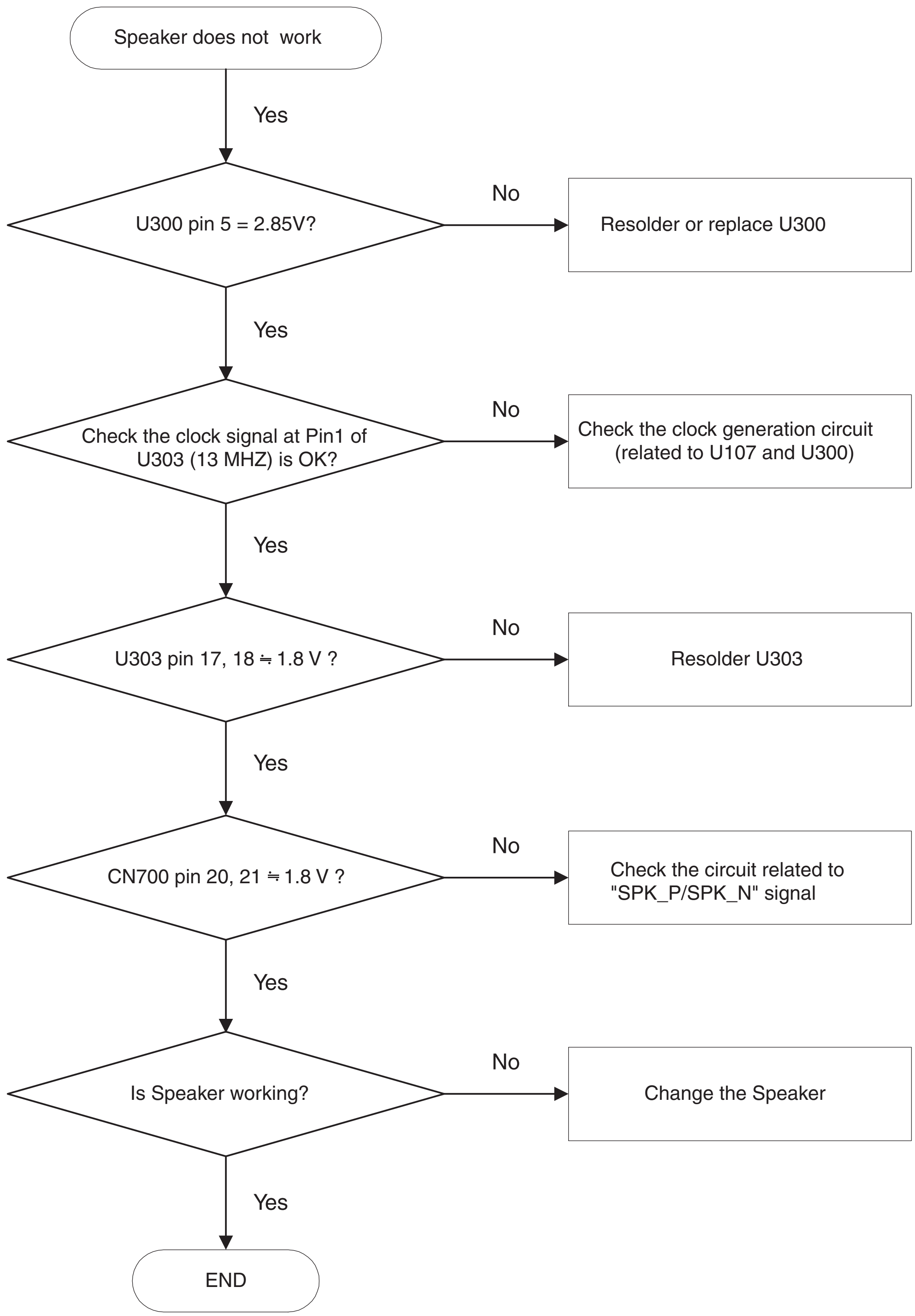


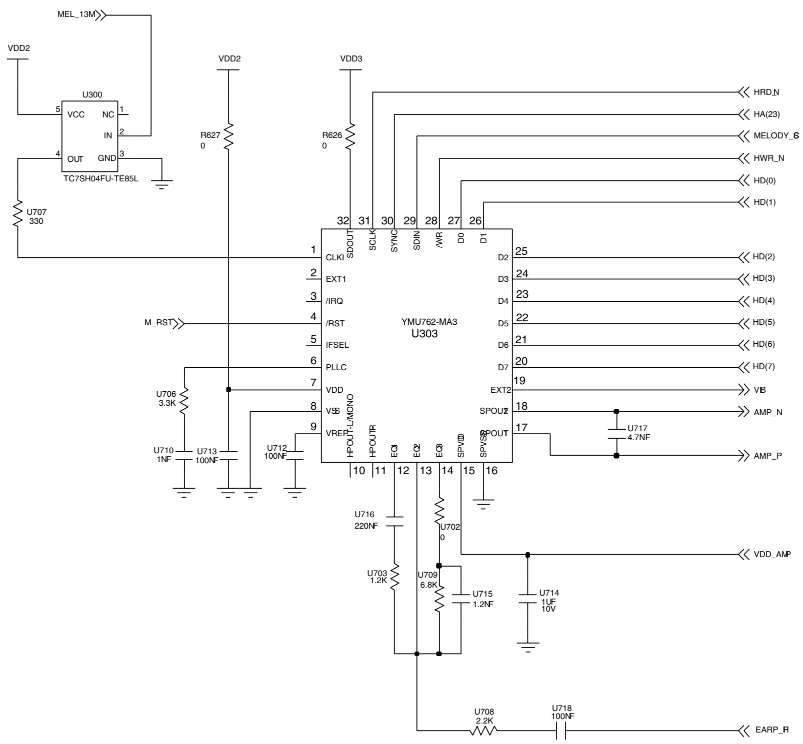
VBAT
C400
100NF
B2 A2 B1 A1
SIMVBAT
SIMGND
SIMSCP
SIMSCN
SM
CHARGE
PUMP
SM
INTERFACE
VCC C2
CLK D2
RST C1
IO D1
CPRES D3
SIMD C7
SIMCLK C6
TP401
TP402
SIMIO
SIMCLK
SIM_VCC
SIM_CLK
SIM_RST
SIM_IO
D105
C402
4.7uF
C403
100NF
CN400
C-292123
D104
D103
D102


Microphone does not work
Yes
Check the connection from MIC
No
Resolder MIC FPCB
Yes
Check the circuit From U200 to MIC
No
Resolder the C603, C610, R601, R603, R606, and R617
Yes
Check the MIC
No
Replace the MIC
Yes
END


U200
MICP
MICN
C603
C610
MIC_BIAS
R601
R617
R603
R606
MIC
+
-

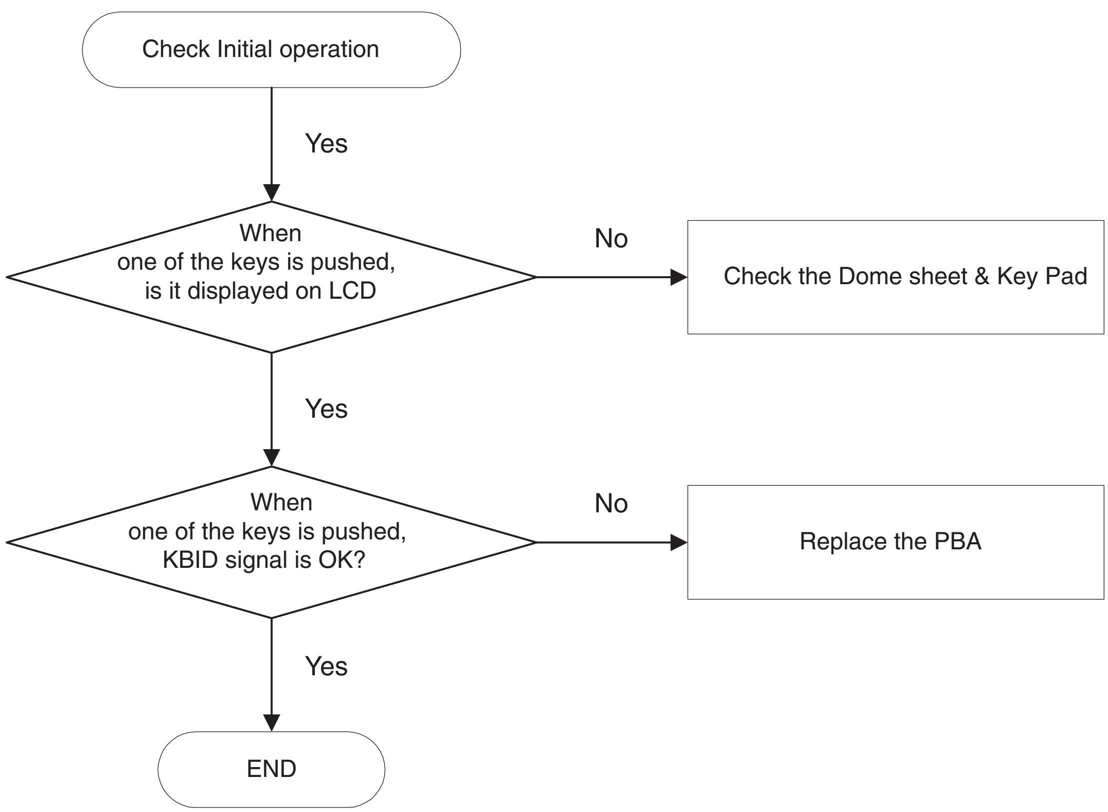
5-6 Speaker Part (Melody)



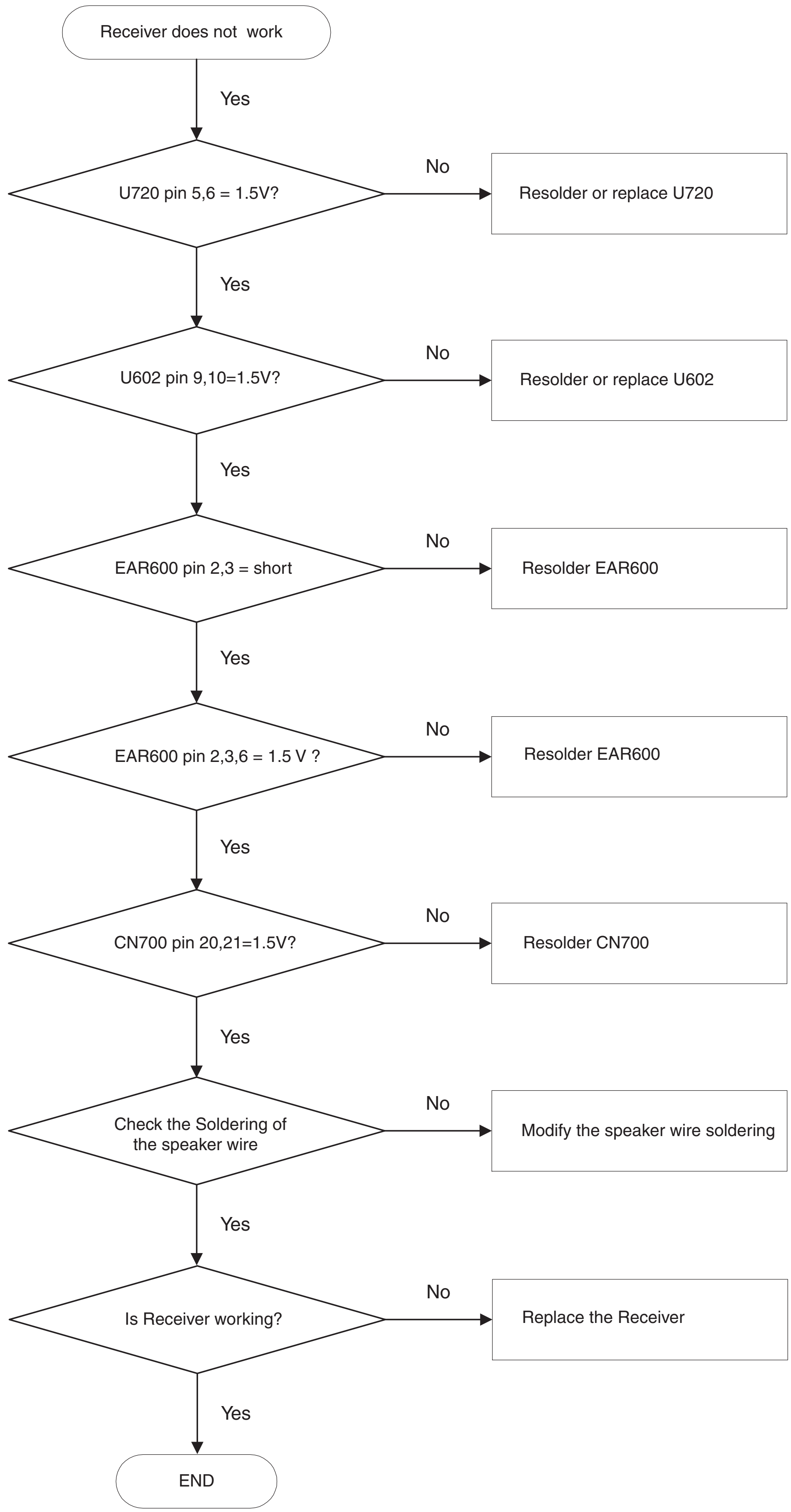

MEL_13M
VDD2
U300
VCC
NC
IN
OUT
GND
TC7SH04FU-TE85L
U707
330
VDD2
R627
0
VDD3
R626
0
HRD_N
HA(23)
MELODY_CS
HWR_N
HD(0)
HD(1)
SDOUT
SCLK
SYNC
SDIN
/WR
D0
D1
CLKI
EXT1
/IRQ
M_RST
/RST
IFSEL
PLLC
VDD
VSS
VREF
YMU762-MA3
U303
D2
D3
D4
D5
D6
D7
EXT2
SPOUT2
SPOUT1
HD(2)
HD(3)
HD(4)
HD(5)
HD(6)
HD(7)
VIB
AMP_N
AMP_P
U717
4.7NF
U706
3.3K
U710
1NF
U713
100NF
U712
100NF
HPOUT-L/MONO
HPOUT-R
EQ1
EQ2
EQ3
SPVDD
SPVSS
U716
220NF
U702
0
VDD_AMP
U703
1.2K
U709
6.8K
U715
1.2NF
U714
1UF
10V
U708
2.2K
U718
100NF
EARP_R

MELODY IC

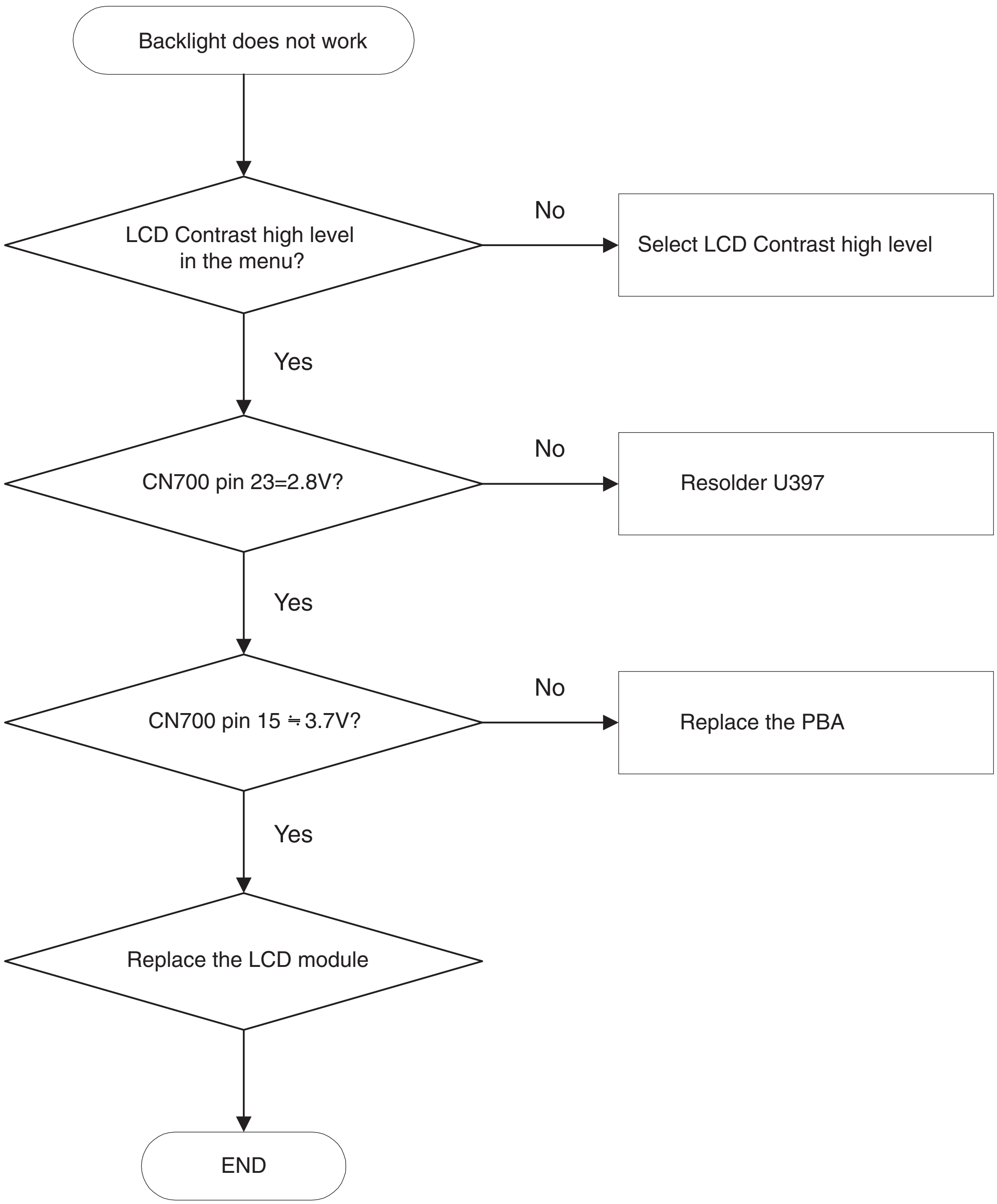
5-7 Key Data Input



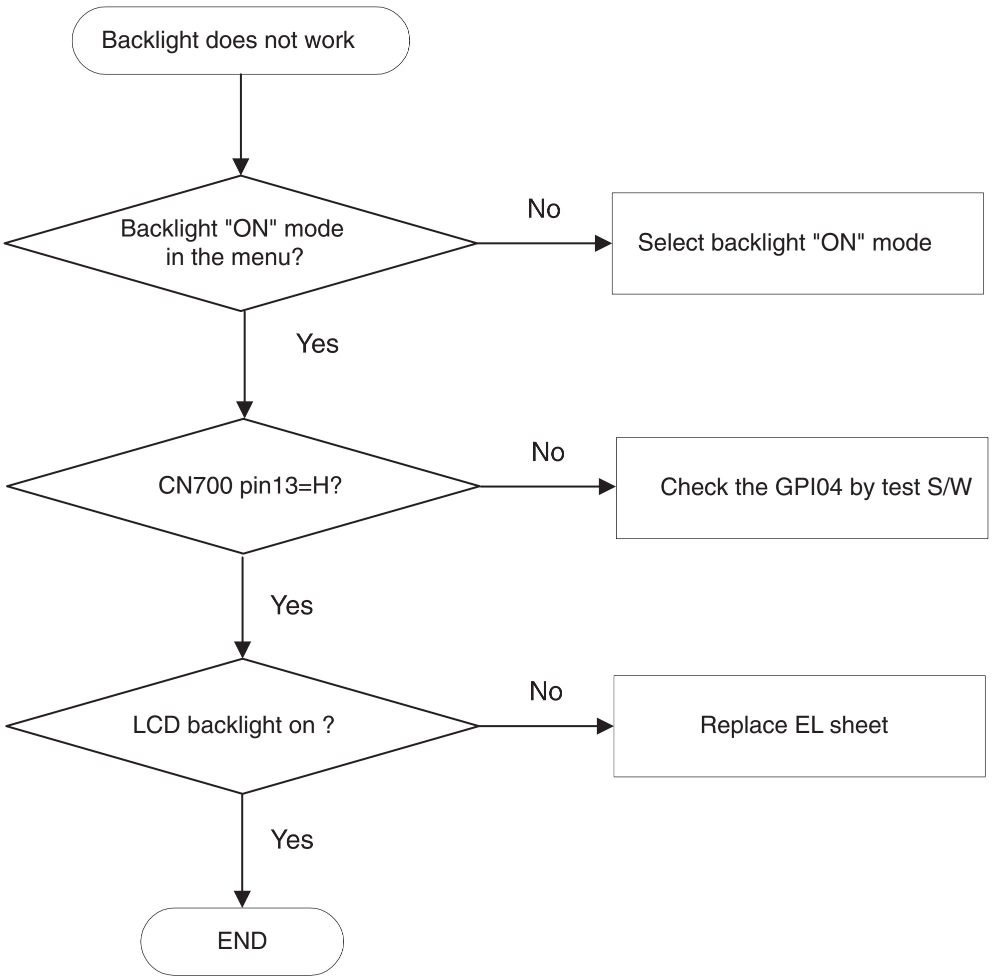
5-8 Receiver Part



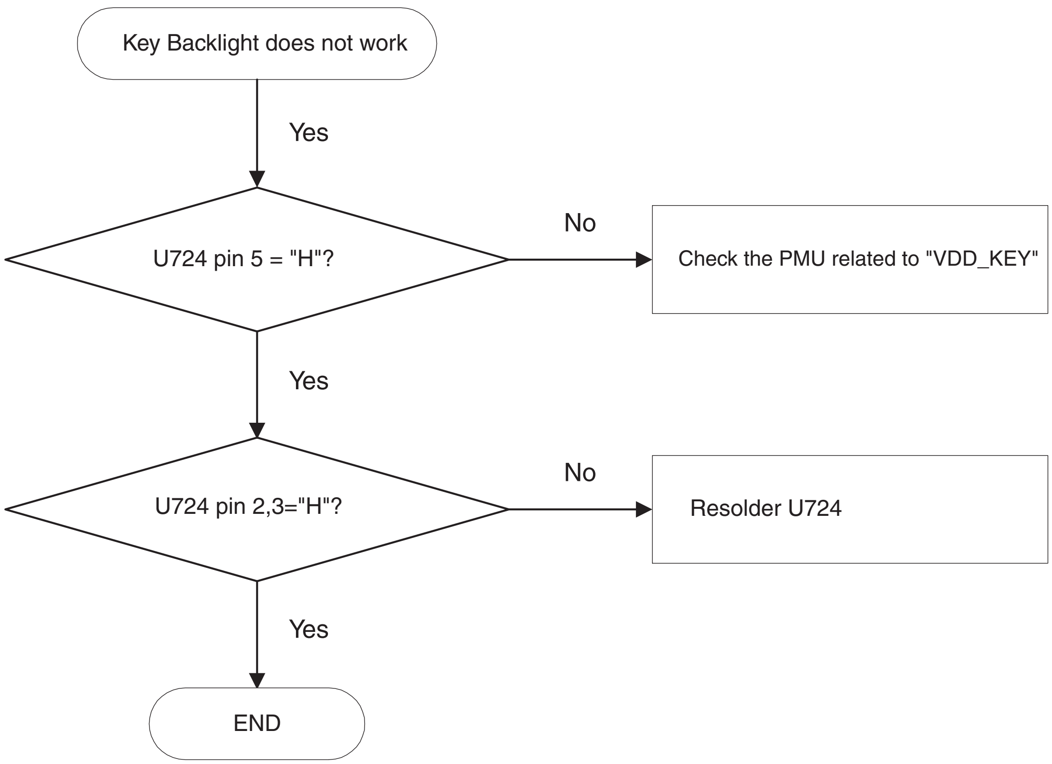
5-9 Back Light (for Color Main LCD)



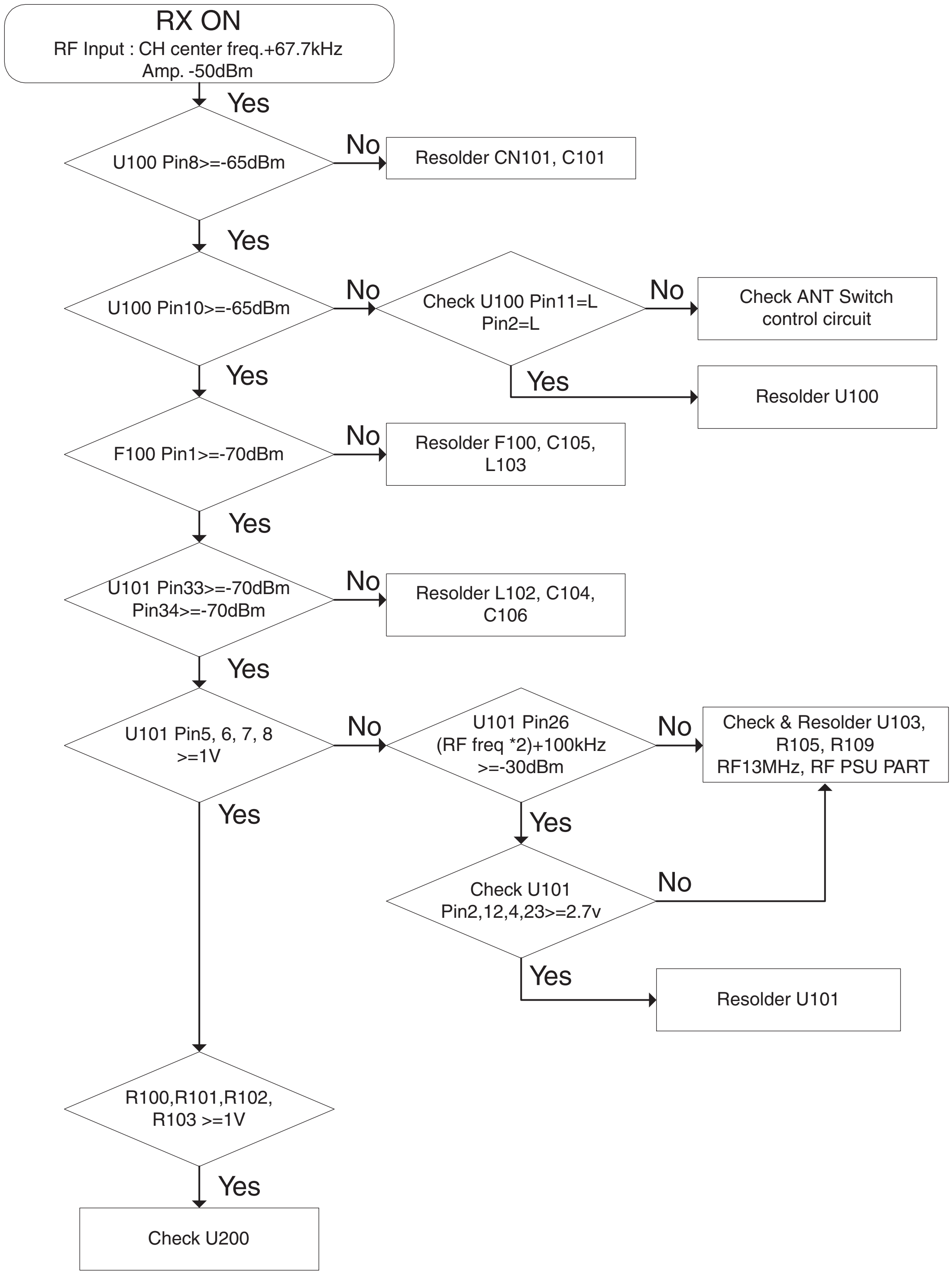
5-10 Back Light (for Sub LCD)



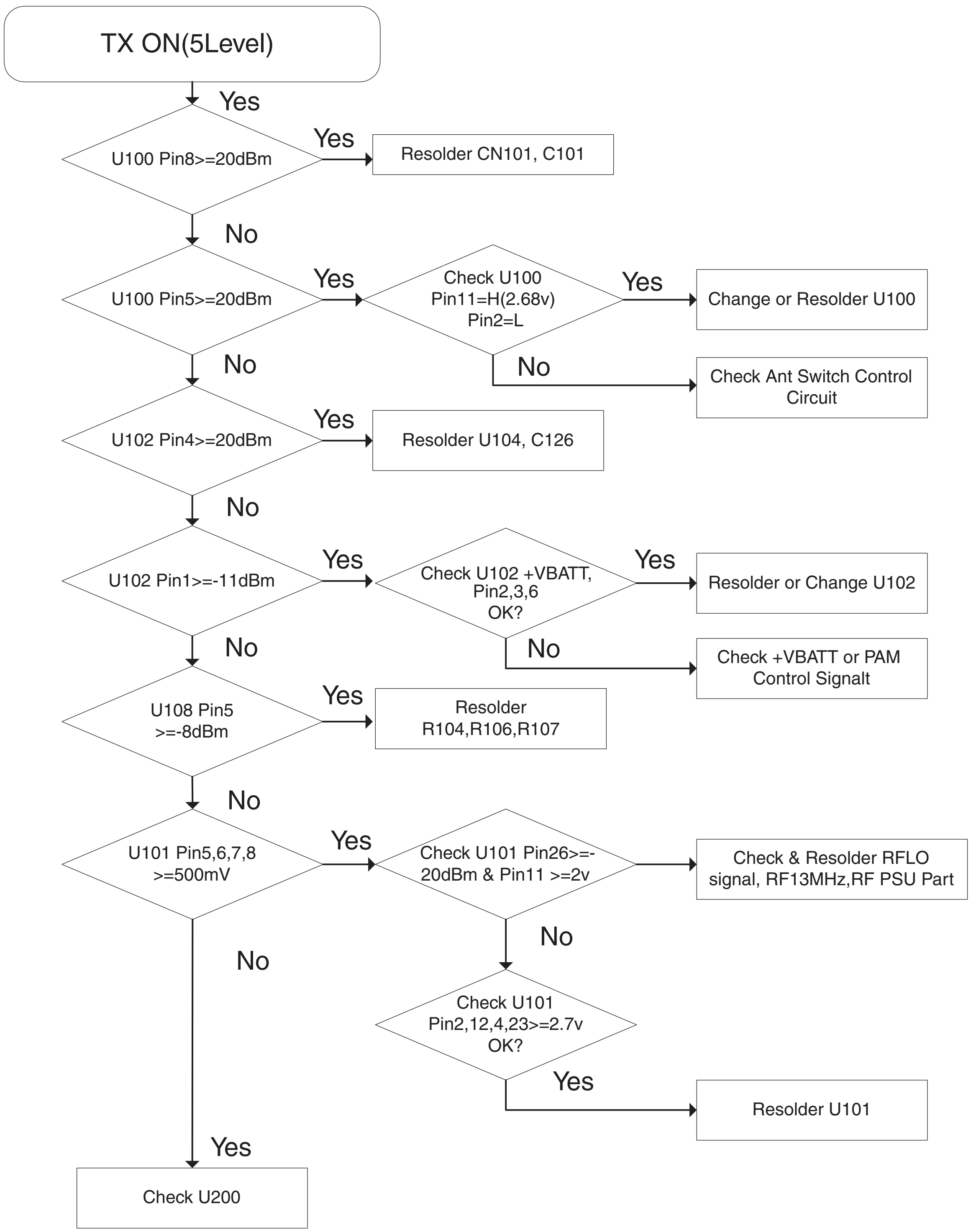
5-11 Key Back Light



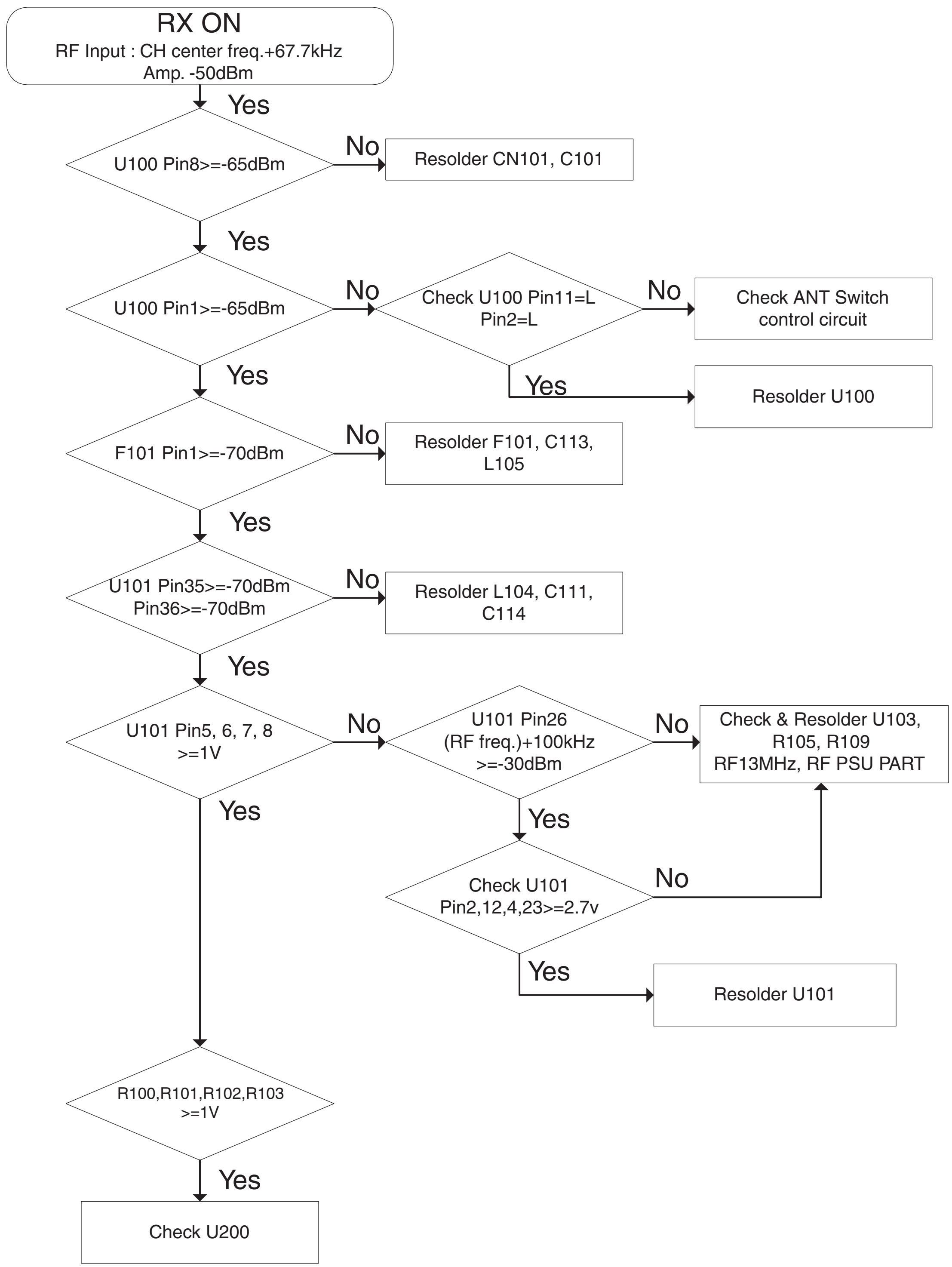
5-12 GSM Receiver



5-13 GSM Trasmitter



5-14 DCS Receiver



5-15 DCS Transmitter

